

REMARKS

The Office Action of August 19, 2009 and the references cited therein have been carefully reviewed. Favorable reconsideration and allowance of the claims are requested in view of the foregoing amendments and the following remarks.

I. Claim Status and Amendments

Claims 23-25 were pending in this application when last examined and stand rejected.

By way of the present amendment, Applicants have added new claims 26-28, which are directed to the elected invention, albeit to a method of manufacturing the surface treated steel sheet of the elected invention. Support can be found in the elected invention of original claims 1-6, 8-9, 12-16, and 21-22, and in the disclosure, for example, at page 7, line 10 to page 11, last line, and at page 13, lines 1-18. Applicants respectfully request that these claims be examined with the elected invention. Applicants will consider dropping the product claims and proceeding with the newly added method claims, if the Examiner believes that doing so will expedite prosecution. No new matter has been added.

Claims 23-28 are pending upon entry of this amendment, and these claims define patentable subject matter warranting their allowance for the reasons discussed herein.

II. Obviousness Rejection

In item 5 on page 3 of the Office Action, the Examiner newly rejected claims 18 and 19 under 35 U.S.C. §103(a) as being obvious over Hirofumi (US 5,576,113) in view of Omura (JP 02-129395A) and Younan (Journal of Applied Electrochemistry, 32: 439-446 (2002)). Omura and Younan are newly cited.

The rejection is respectfully traversed as applied to previous claims 23-25 and new claims 26-28.

To clarify the record, the rejection should have been over claims 23-25, as opposed to claims 18 and 19, since the later claims were previously cancelled and replaced with claims 23-25. The Examiner even discusses claims 23, 24, and 25 in the body of the rejection. Regardless, it is believed that the rejection should be withdrawn for the reasons discussed below.

As to product claims 23-25, Hirofumi fails to disclose or suggest the arrangement of the various layers in the surface treated sheet for a battery case of main claim 23 (the same can be said for new main claim 26). Specifically, Hirofumi does not disclose "a diffusion layer of a nickel-cobalt-phosphorus alloy formed as an uppermost layer at said one of said two surfaces to be used as the inner surface of the battery case" as required in claim 23. Indeed, the Examiner, at line 4 from the bottom of page 3 of the Office Action, acknowledges this deficiency in Hirofumi.

The Examiner relies on the newly cited secondary references of Omura and Younan as allegedly teaching the missing feature of Hirofumi. Applicants respectfully disagree and submit that Omura and Younan fail to disclose or suggest that for which they are being offered. It is further submitted that Hirofumi teaches away from this combination.

At the bottom of page 3, the Examiner contends that Omura discloses forming an upper layer of a nickel-phosphorus alloy on at least one side to produce a sheet with high hardness and excellent in flaw resistance, workability and corrosion resistance. However, this disclosure of a nickel-phosphorus alloy in Omura is not a disclosure or a suggestion of a nickel-cobalt-phosphorus alloy, let alone one formed as an uppermost layer at said one of said two surfaces to be used as the inner surface of the battery case.

The Examiner next turns to the secondary reference of Younan as teaching that a nickel-cobalt-phosphorus alloy coating exhibits electrochemical and physical characteristics (e.g., hardness and corrosion resistance) superior to that of a nickel-phosphorus alloy. However, nowhere does Younan disclose or suggest nickel-cobalt-phosphorus alloy as an uppermost layer on the inner side of the steel sheet to form the battery case.

Yet, the Examiner argues that it would have been obvious to form a nickel-cobalt-phosphorous alloy as an uppermost

layer on the inner side of the steel sheet to form the battery case of Hirofumi, because Omura teaches the advantages of using Ni-P alloy coating and Younan teaches that Ni-Co-P alloy coatings are superior to Ni-P alloy coatings.

However, Applicants respectfully submit Hirofumi cannot be combined with Omura and Younan to arrive at the claimed subject matter, because Hirofumi teaches away from the concept of the placing a nickel-cobalt-phosphorus alloy layer as the uppermost layer (as required in the main claims), and thus it teaches away from the combination.

It is well established that a prior art reference must be considered in its entirety, *i.e.*, as a whole, including portions that would lead away from the claimed invention. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984). *M.P.E.P.*, Eighth Ed., Rev. 7 (July 2008) at § 2141.02, VI. Moreover, a prior art reference that "teaches away" from the claimed invention is a significant factor to be considered in determining obviousness. *M.P.E.P.*, Eighth Ed., Rev. 7 (July 2008) at § 2145, X, D, 1. References cannot be combined where a reference teaches away from their combination. *See, M.P.E.P.*, Eighth Ed., Rev. 7 (July 2008) at § 2145, X, D, 2.

As argued in the last response, Hirofumi discloses that a sheet, to be formed into a battery can, is comprised of Ni

plated layers formed on an upper and lower surface of the steel plate, and it is clearly essential in Hirofumi to place the Ni plate as the uppermost layer, not a nickel-cobalt-phosphorus alloy layer, as required in claim 23 and new claim 26. See the disclosure at columns 25 and 26 of Hirofumi. Since Hirofumi teaches that the Ni plate must be used as the uppermost layer, the reference teaches away from the concept of the placing a nickel-cobalt-phosphorus alloy layer as the uppermost layer (as required in the main claims), and thus it also teaches away from the combination of references.

Accordingly, no combination of the cited references would result in a nickel-cobalt-phosphorus layer positioned at the uppermost layer of the inner surface for a battery case as recited in independent claim 23. The same arguments also apply as to new method claims 26-28.

In addition, it should be noted that Hirofumi discloses that a steel plate, processed into a battery can, serves as a substrate for Fe-Ni diffusion layers disposed on both sides of the plate and bright Ni-plated layers disposed on the outer side of each Fe-Ni diffusion layer.

The disclosure in Omura relates to coating both surfaces of a steel sheet with a Ni plating and/or a Ni-Fe alloy plating, and forming an upper layer of a Ni-P alloy on at least

one side, to produce a sheet with high hardness and excellent in flaw resistance, workability, and corrosion resistance.

However, these two references refer to hardness, Workability, and corrosion resistance but not to battery performance as taught by the present application because of a diffusion layer of a nickel-cobalt-phosphorus alloy, as required in the claims of the instant application.

Younan teaches that a Ni-Co-P alloy coating exhibits electrochemical and physical characteristics (e.g., hardness and corrosion resistance) superior to that of a Ni-P alloy.

However, as taught by the experiments and theory of Younan, electrochemical characteristic means only corrosion resistance, which is totally different from IR, SCC and Discharge Characteristics as taught by the disclosure in the present application.

Also, in both experiments of hardness study and corrosion resistance in Younan, deposition experiments were performed onto mild steel panels without any preparation. Therefore, Omura al. and Younan do not disclose or suggest the battery performance after conducting a deep draw forming method to form a battery case as required by both product claims 23-25 and method claims 26-28 of the present application.

It is believed that, in addition to the teaching away in Hirofumi, these arguments effectively rebut the Examiner's

motivation to replace the Ni-P alloy in Omura with the Ni-Co-P alloy coating in Younan to arrive at either the product of claims 23-25 or the method of claims 26-28.

Furthermore, it should be noted that a Ni-Co-P alloy in Younan is non-electrolytic plating (Younan, 2. Experimental procedure and Table.1) and the deposition was carried out onto mild steel panels by the electroless Ni-Co-P electrolyte. Therefore, Younan and Omura do not disclose or suggest the claimed method steps of:

- 1) forming a nickel-cobalt-phosphorus alloy plating by electrolytic plating;
- 2) forming an iron-nickel diffusion layer after Ni plating on a steel sheet; and
- 3) forming a nickel-cobalt-phosphorus plating layer after Ni plating on a steel sheet.

Accordingly, no combination of the cited references would result in a battery case with excellent battery performance by forming a diffusion layer of a nickel-cobalt-phosphorus alloy at a surface to be used as the inner surface of the battery case as taught by the present invention.

Omura teaches in the paragraph "one side plating/both sides plating" on page 4 that "for instance, in the case of using Ni plating and/or Ni-P alloy plating to a battery case such as alkaline manganese cell and Ni-Cd cell, in order to

deal with damages on a battery case while at work, only Ni plating layers is formed at the inner side of cylinder state case with bottom and Ni plating layer, and Ni-P alloy plating layers are formed at the outer side of the case.

As such, it is believed that Omura, similar to Hirofumi, actually teaches away from the concept of a nickel-cobalt-phosphorus layer positioned at the uppermost layer of the inner surface for a battery case as recited in main claims 23 and 26.

That is, Omura focuses on preventing damage on a battery case by using Ni-P alloy plating layer at the outer side of the case, however, they do not disclose or suggest a battery case with excellent battery performance by forming a Ni-P alloy at a surface to be used as the inner surface of the battery case as taught by the present invention.

For these reasons, neither Younan nor any combination thereof with Omura and/or Hirofumi disclose or suggest a battery case with excellent battery performance by forming a diffusion layer of a nickel-cobalt-phosphorus-alloy at a surface to be used as the inner surface of the battery case as required in the claims of the present application.

Thus, no combination of the cited references would arrive at each and every element of the claims. Accordingly, main claims 23 and 26, and all claims dependent thereon, are

believed to be novel and patentable over the combination of Hirofumi, Omura, and Younan. For these reasons, it is clear that the combined references fail to render obvious the claims. Withdrawal of the rejection is requested.

III. Conclusion

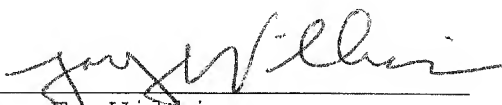
Having addressed all the outstanding issues, the amendment is believed to be fully responsive to the Office Action. It is respectfully submitted that the claims are in condition for allowance, and favorable action thereon is requested.

If the Examiner has any comments or proposals for expediting prosecution, please contact the undersigned attorney at the telephone number below.

Respectfully submitted,

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